



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/016,844	12/14/2001	Kevin Harris Becker	1978.EEM	8825

7590

10/03/2003

Jane E. Gennaro
Assistant General Counsel, I.P.
NATIONAL STARCH AND CHEMICAL COMPANY
10 Finderne Avenue
Bridgewater, NJ 08807-0500

EXAMINER

SELLERS, ROBERT E

ART UNIT

PAPER NUMBER

1712

DATE MAILED: 10/03/2003

3

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/016,844

Applicant(s)

BECKER ET AL.

Examiner

Robert Sellers

Art Unit

1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) 7 and 8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-7, drawn to a B-stageable adhesive, classified in class 525, subclass 533.
- II. Claim 8, drawn to a method of attaching a semiconductor, classified in class 156, subclass 330.
- III. Claim 9, drawn to a B-stageable adhesive deposited on substrate, classified in class 428, subclass 413.

The inventions are distinct, each from the other because:

Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case, the product as claimed can be used in a materially different process of using that product such as a method of fabricating a molded object.

Inventions I and III are related as mutually exclusive species in an intermediate-final product relationship. Distinctness is proven for claims in this relationship if the intermediate product is useful to make other than the final product (MPEP § 806.04(b), 3rd paragraph), and the species are patentably distinct (MPEP § 806.04(h)). In the instant case, the intermediate product is deemed to be useful as a molding composition and the inventions are deemed patentably distinct since there is nothing on this record to show them to be obvious variants.

Art Unit: 1712

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions anticipated by the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Inventions III and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the product as claimed can be made by another and materially different process such as the underfilling of a semiconductor chip or die.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Jane E. Gennaro on September 3, 2003, a provisional election was made with traverse to prosecute the invention of Group I, claims 1-7. Affirmation of this election must be made by applicant in replying to this Office action. Claims 8 and 9 are withdrawn from further consideration under 37 CFR 1.142(b) as being drawn to non-elected inventions.

The application has been transferred to Art Unit 1712 based on the foregoing election. The following election of species requirement is proposed.

This application contains claims directed to the following patentably distinct species of the claimed invention:

- 1) The first compositions of claim 4.
- 2) The second compositions such as the epoxy resin of claim 5.
- 3) The presence or absence of the imidazole/anhydride adduct, wherein if its presence is elected, a particular species thereof is identified such as that of claim 7.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 1-7 are generic.

A reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

During a telephone conversation with Jane E. Gennaro on September 4, 2003, a provisional election was made with traverse to prosecute the species of bismaleimide in combination with the cinnamyl compound depicted on page 12, line 3 as the first composition, a bisphenol A epoxy resin as the second composition, and the presence of the 1,2,4,5-benzenetetracarboxylic anhydride/2-phenyl-4-methylimidazole adduct of claim 7, claims 1-7. Affirmation of this election must be made by applicant in replying to this Office action. No claims are withdrawn from further consideration as being directed to non-elected species

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5 are rejected under 35 U.S.C. 102(a) as being anticipated by Satoh et al.

Satoh et al. (cols. 4-5, Example 1) shows an adhesive comprising epoxy resins, bismaleimide, polyethersulfone and imidazole accelerator semicured at 140°C and cured at 200°C.

Claims 1 and 3-6 are rejected under 35 U.S.C. 102(a or b) as being anticipated by Capote et al. or Japanese Patent Nos. 61-237436 (Japanese '436) or 55-65217 (Japanese '217) or Young or Jackson.

Capote et al. (pages 8-9, Example 6) shows an adhesive containing a bismaleimide and 2-allylphenyl glycidyl ether (APGE, page 7, paragraphs 81 and 82) pre-staged at about 113°C. An epoxy resin and catalyst are added and the mixture is cured at 125°C, 175°C, 200°C, 225°C and 250°C

Japanese '436 discloses a semi-curable adhesive comprising a bismaleimide, triazine resin and epoxy resin.

Japanese '217 sets forth a formulation which adheres reinforcing fibers (i.e. impregnation) wherein a blend of a bismaleimide (formula (I) on page 1 of the patent), an epoxy resin, an epoxy resin hardener such as pyromellitic anhydride, and a photosensitizer is semi-cured followed by heat curing.

Young (cols. 5-6) shows the adhering of laminates (col. 6, lines 1-8) with a composition prepared from an epoxy resin, a bisphenol A novolak, bismaleimide and 2-methylimidazole which is B-staged (col. 5, lines 2-9) at 163°C and cured at 180°C and 200°C.

Jackson (col. 5, Example 1) shows the adhering of laminates using a mixture of a bismaleimide, an epoxy resin and cyanamide which is B-staged at 163°C and cured at 180°C and 220°C.

The curing temperatures and particular combinations of bismaleimide and epoxy resin within the ambit of the claimed and elected species of first and second compositions inherently possess curing temperatures sufficiently separated to cure the first composition of the bismaleimide without curing the second composition of the epoxy resin.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoh et al., Capote et al., Japanese '436 and '217, Young and Jackson in view of Roth et al. and Marshall et al. and Japanese Patent No. 57-100128 (Japanese '128).

The claimed imidazole/anhydride adduct of claim 6, particularly the 1,2,4,5-benzenetetracarboxylic anhydride/2-phenyl-4-methylimidazole of claim 7, is not recited, although the references are open to the use of imidazole accelerators.

Roth et al. epouses an epoxy resin composition (col. 1, line 65 to col. 2, line 3 and col. 5, lines 48-49) curable in the presence of an adduct of 2-phenyl-4-methylimidazole (col. 7, line 24) and pyromellitic acid (col. 7, line 42).

Marshall et al. sets forth an epoxy resin curing agent comprising a salt of an imidazole such as 2-ethyl-4-phenylimidazole (col. 4, line 57) and an anhydride which "exhibit reduced hygroscopicity and extended pot life (col. 4, lines 11-12)."

Japanese '128 shows a 2-methylimidazole-pyromellitic anhydride salt utilized as a curing assistant for an epoxy resin.

It would have been obvious to employ the imidazole/anhydride adduct of Roth et al. and Marshall et al. derived from the 2-phenyl-4-methylimidazole of Roth et al. and the pyromellitic anhydride of Japanese '128 as the accelerator of Satoh et al., Capote et al., Japanese '436 and '217, Young and Jackson in order to reduce the hydroscopicity and extend the pot life of the compositions.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Musa (col. 7, Example 4, a styrenic donor corresponding to the example depicted in the specification on page 9, the second formula of the styrenic donors) shows a styrenic electron donor compound which can be blended with a maleimide (col. 4, line 16).

Art Unit: 1712

Musa et al. (col. 5, Example 3, a cinnamyl donor corresponding to the first formula on page 9 of the specification) shows a cinnamyl adhesion promotor combinable with a curable resin (col. 2, lines 61-64).

Musa and Musa et al. are pertinent to claim 4 denoting species of first compositions including a bismaleimide in combination with styrenic or cinnamyl compounds.

Japanese Patent No. 1- or 64-56719 shows a 2-phenyl-4-methylimidazole/methyltetrahydrophthalic anhydride adduct hardener for epoxy resins.

(703) 308-2399 (Fax no. (703) 872-9306)
Monday to Friday from 9:30 to 6:00 EST



Robert Sellers
Primary Examiner
Art Unit 1712

rs
9/24/03